

IN THE CLAIMS

1. (Currently amended) A method for cleaning a deposition chamber which has a metal oxide attached therein, the method comprising:

providing a first gas into the deposition chamber, the first gas being a gas which reacts with the metal to generate a reacting residue, wherein the deposition chamber does not contain a plasma;

providing a second gas into the deposition chamber, the second gas being a gas which decomposes the reacting residue; and

removing the decomposed reacting residue from the chamber,
whereby the metal oxide is removed from the chamber.

2. (Original) The method of claim 1, wherein the first gas includes a fluorine-containing gas.

3. (Original) The method of claim 2, wherein the fluorine-containing gas includes a hydrogen fluoride (HF) gas, a fluorine (F₂) gas, or a sulfur hexafluoride (SF₆) gas.

4. (Original) The method of claim 1, wherein the second gas includes a water (H₂O) vapor.

5. (Currently amended) The method of claim 1, further comprising providing at least one additional gas selected of a nitric acid (HNO₃) gas and an alcohol-containing gas into the deposition chamber, the additional gas diluting the first and second gases to reduce the removal rate of the metal oxide.

6. (Cancelled)

7. (Original) The method of claim 1, further comprising exciting the first gas and the second gas outside of the deposition chamber before providing the first gas and the second gas into the deposition chamber.

8. (Original) The method of claim 1, wherein the deposition chamber has a temperature of about 50 to about 650°C.

9. (Original) The method of claim 1, wherein the deposition chamber has a pressure of about 0.1 to about 100 Torr.

10. (Original) The method of claim 1, wherein the metal oxide includes aluminum oxide (Al₂O₃).

11. (Original) The method of claim 1, wherein the first gas and the second gas are concurrently provided into the deposition chamber through separate gas supply lines.

12. (Original) The method of claim 1, wherein the first gas and the second gas are mixed in one gas supply line and are concurrently provided into the deposition chamber.

13. (Original) The method of claim 1, wherein providing the first gas and the second gas further comprises:

providing the first gas into the deposition chamber for a predetermined time; and

periodically providing the second gas into the deposition chamber during that same time that the first gas is provided.

14. (Original) The method of claim 1, wherein providing the first gas and the second gas further comprises:

providing the second gas into the deposition chamber; and

periodically providing the first gas into the deposition chamber during that same time that the second gas is provided.

15. (Original) The method of claim 1, wherein the first gas and the second gas are alternatively provided into the deposition chamber.

16. (Currently amended) A method for cleaning a deposition chamber comprising:

providing a fluorine-containing gas and a water vapor into the deposition chamber including an aluminum oxide attached therein, wherein the fluorine-containing gas is reacted with an aluminum included in the aluminum oxide to generate reacting residues and the water vapor decomposes the reacting residues, and wherein at least one of the fluorine-containing gas and the water vapor is continuously flowed into the deposition chamber during a cleaning process while maintaining the deposition chamber at a pressure of greater than 1 Torr;

whereby the aluminum oxide is removed from the deposition chamber by reacting the aluminum oxide with the fluorine-containing gas and the water vapor.

17. (Original) The method of claim 16, wherein providing the fluorine-containing gas and the water vapor further comprises:

providing the fluorine-containing gas into the deposition chamber; and

periodically providing the water vapor into the deposition chamber during the same time that the fluorine-containing gas is provided.

18. (Original) The method of claim 16, wherein providing the fluorine-containing gas and the water vapor further comprises:

providing the water vapor into the deposition chamber; and

periodically providing the fluorine-containing gas into the deposition chamber during the same time that the water vapor is provided.

19. (Currently amended) A method for cleaning a deposition chamber comprising: alternatively providing a fluorine-containing gas and a water vapor into the deposition chamber including an aluminum oxide attached therein, wherein the fluorine-containing gas is reacted with an aluminum included in the aluminum oxide while maintaining the deposition chamber at a pressure of greater than 1 Torr to generate reacting residues and the water vapor decomposes the reacting residues; and

removing the aluminum oxide from the deposition chamber by reacting the aluminum oxide with the fluorine-containing gas and the water vapor.

20. (Withdrawn) A deposition apparatus comprising:

a deposition chamber;

a wafer chuck for loading a wafer, the wafer chuck being disposed in the deposition chamber;

a gas supply member having a deposition gas supply line for providing a deposition gas into the deposition chamber, and cleaning gas supply lines for providing cleaning gases into the deposition chamber;

a plasma generating member for exciting gases provided through the gas supply member to generate plasmas; and

an exhaust member for pumping out reacting residues generated in the deposition chamber.

21. (Withdrawn) A deposition apparatus comprising:

a deposition chamber;

a wafer chuck disposed in the deposition chamber;

a gas supply member having a deposition gas supply line for providing a deposition gas into the deposition chamber, and first and second cleaning gas supply lines for providing cleaning gases into the deposition chamber, wherein the first and second cleaning gas supply lines are integrated to provide mixed cleaning gases into the deposition chamber;

a plasma generating member for exciting gases provided through the gas supply member to generate plasmas; and

an exhaust member for pumping out reacting residues generated in the deposition chamber.

22. (Currently amended) A method for cleaning a deposition chamber comprising:

providing a first gas and a second gas into the deposition chamber with metal oxide attached therein, wherein the deposition chamber does not contain a plasma;

reacting the first gas with a metal included in the metal oxide to generate a reacting residue;

decomposing the reacting residue with the second gas; and

removing the decomposed reacting residue through an exhaust line.

23. (Original) The method of claim 22, wherein the first gas includes a fluorine-containing gas.

24. (Original) The method of claim 22, wherein the second gas includes a water vapor.

25. (Currently amended) A method for cleaning a chamber which has a metal oxide attached to an inside surface thereof, the method comprising:

providing a first gas into the chamber, the first gas being a gas which reacts with the first metal to generate a reacting residue, wherein the chamber does not contain a plasma;

providing a second gas into the chamber, the second gas being a gas which decomposes the reacting residue; and

removing the decomposed reacting residue from the chamber.

26. (New) A method for cleaning a deposition chamber which has a metal oxide attached therein, the method comprising:

maintaining a pressure in the deposition chamber of greater than 1 Torr;

providing a first gas into the deposition chamber, the first gas being a gas which reacts with the metal to generate a reacting residue, wherein the deposition chamber does not contain a plasma;

providing a second gas into the deposition chamber, the second gas being a gas which decomposes the reacting residue; and

removing the decomposed reacting residue from the chamber,

whereby the metal oxide is removed from the chamber.